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Manual
for Propeller Type
H30V

Propeller Type:

Propeller Serial No.:

Date of Sale:

Seal and Signature of Manufacturer:

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1 List of Modifications

Version (Date)	Chapter	Description	Name
Version 02/2009		First Edition	KUB
27.07.2011	1 List of Modifications 7 Maintenance → new 8 Maintenance	Insert the Chapter "List of Modifications" Paragraph	TKU

2 Description

HELIX propeller have been built since 1990 using composite materials such as carbon fibre, epoxy-resin, epoxy resin foam and aluminium.

This combination of materials provides:

- **High Thrust**
- **Low Noise**
- **Durability**

Figure 1: 2-blade, 3-blade and 4-blade propeller of type H30V

2.1 Blades

The Propeller Blades are made from several layers of woven carbon fibre, reinforced with different sorts of carbon fibre tapes. They are bonded with epoxy resin foam reinforced by glass fibre. This method of construction which ensures that the load is distributed throughout the whole surface of the Blade and dissipates vibration.

At voluminous profile series optionally a construction method with three-dimensional-fabric instead of epoxy resin foam is used. This construction method guarantees a low weight combined with high strength and rigidity.

2.2 Hubs

The hub is milled from an aluminium block using a CNC process. This allows the weight of the hub to be minimised whilst the cylindrical design reduces aerodynamic drag. The hub has a hard anodised finish providing good corrosion resistance. Inside weight reducing drillings and blind holes are arranged and embedded. Optional are Adapter-center-discs for different engine-flanges available.

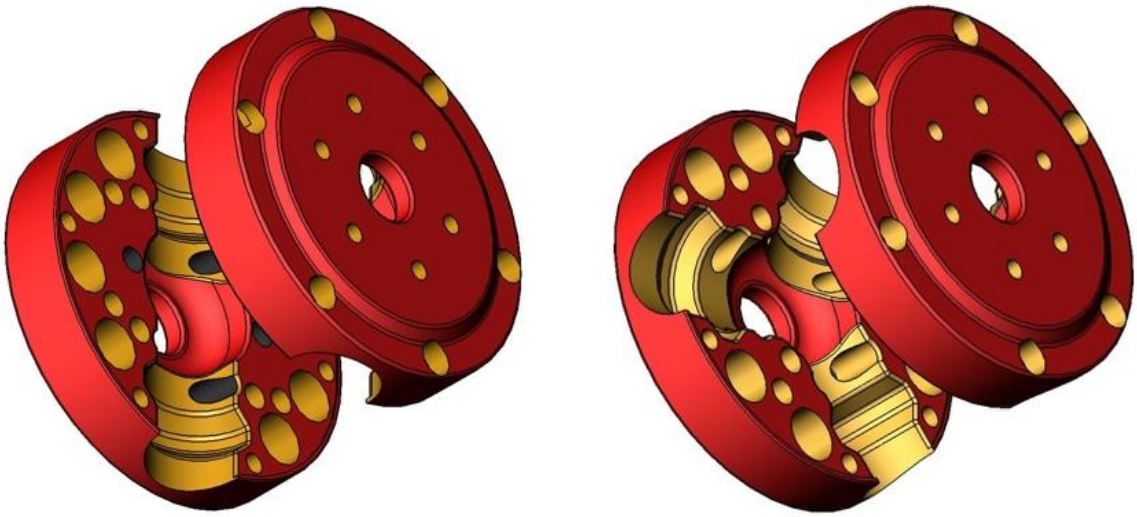


Figure 2: 2-Blade and 3-Blade Hub

3 Specification of Propeller Type

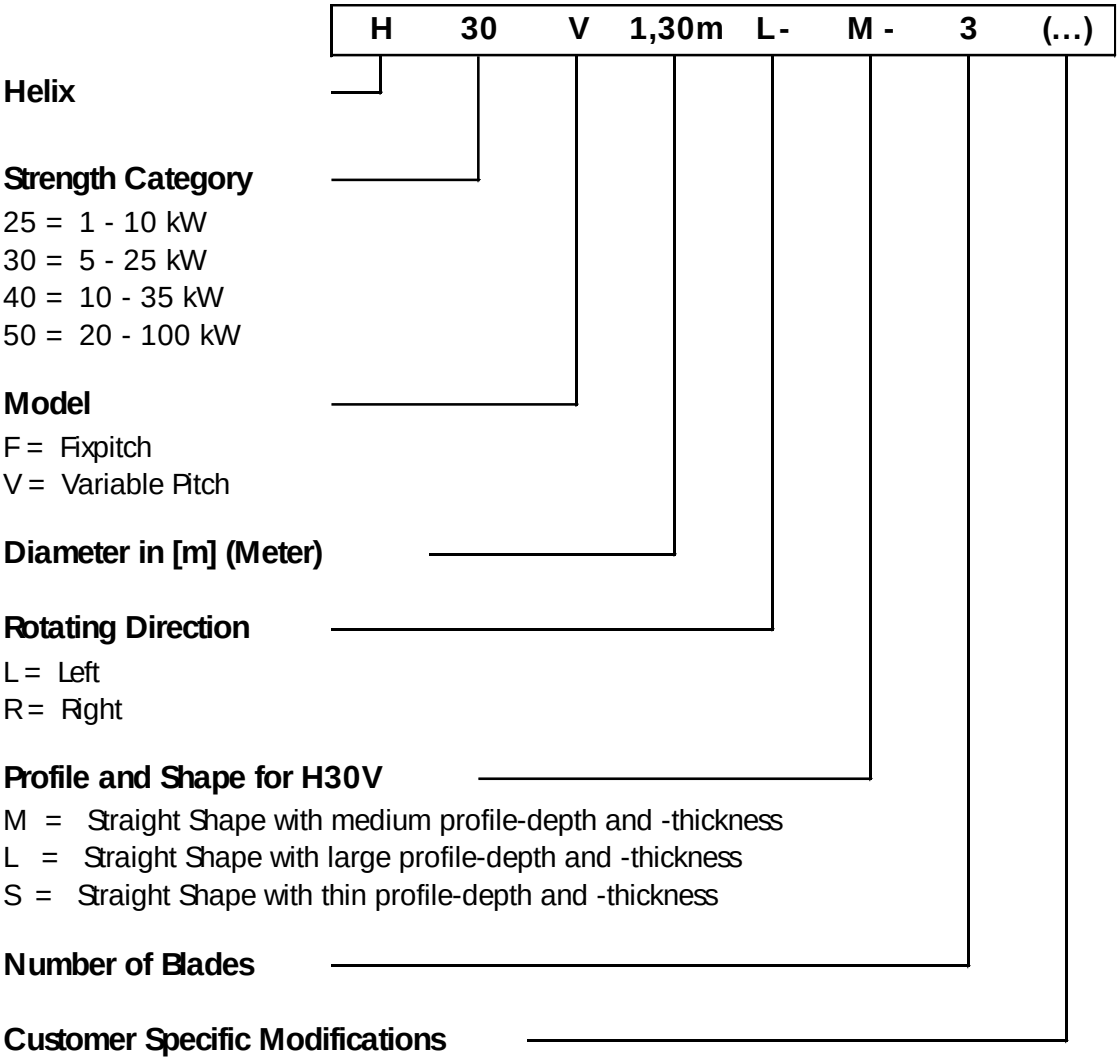


Table 1: Specification of the propeller type, Structure of the Helix Propeller Name

4 Operating Limitations

HELIX Propellers are constructed for giving thrust to aircrafts with an engine output of between 1 and 100 kW using 2-stroke, 4-stroke, Wankel- or electric engine.

The operating limitations for the here described propeller types of **H30V** as 2-, 3- and
4-Blade-Version in clockwise and anti-clockwise rotation are for Diameters from 1,00m to 1,55m.

There is to distinguish:

For propeller of size from **1,00m - 1,25m**:

- Maximum propeller-rpm: **4.300 rpm**
- Maximum engine power: **25 kW**

For propeller of size from **1,30m - 1,55m**:

- Maximum propeller-rpm: **3.000 rpm**
- Maximum engine power: **25 kW**

Warning:

If the maximum operating values are exceeded the propeller, engine or gearbox may be damaged. If the propeller becomes damaged its balance will be affected which can cause failure of the engine mountings.

Before starting the engine, the pilot must ensure that the area around the propeller is free from debris to avoid any impacts on the blades by foreign objects.

The engine can only be hand started by qualified personnel.

5 Installation

- Both halves of the hub have stamped the same serial number on their side. At first check if the halves of the hub have the same serial number.
- Mount the blades in one half of the hub following their designation.
- Fit the other half of the hub ensuring that the letters stamped into the hub line up.
- Loosly tighten the M6 bolts securing the two halves of the hub together.
- Attach the propeller to the aircraft using the M8 bolts. Loosely tighten the bolts.
- Now the propeller is ready for adjustment. It is strongly recommended to do this on the aircraft because it achieves the highest precision.

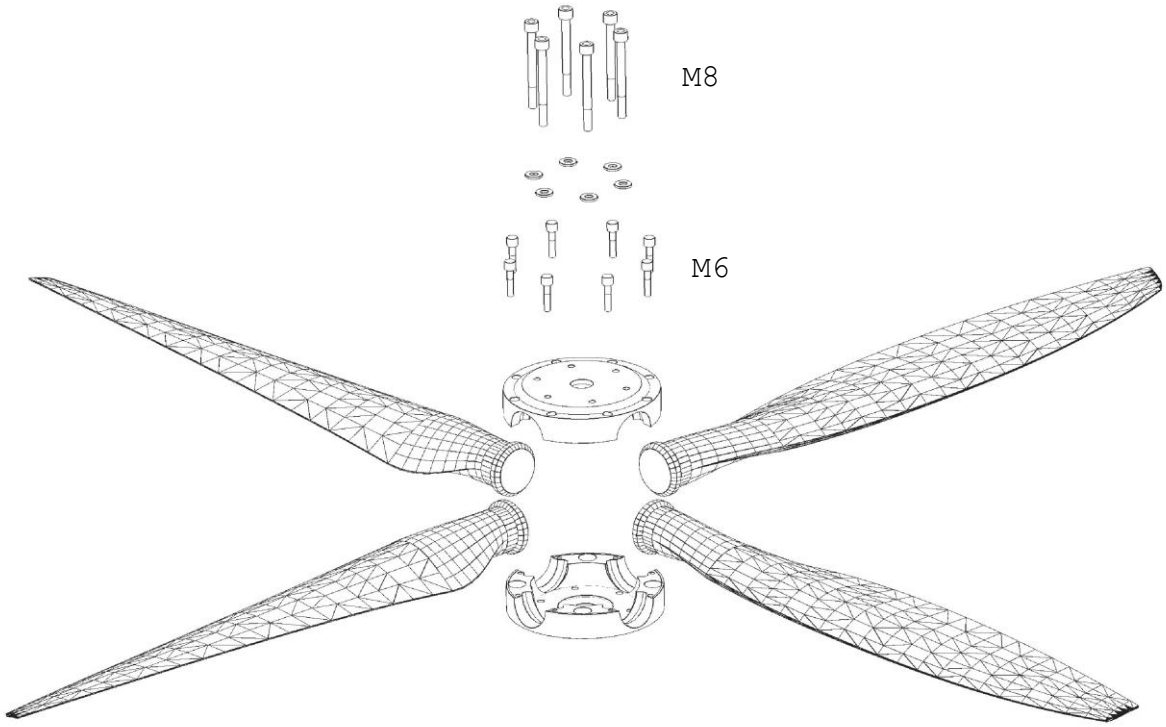


Figure 3: Composing of the Propeller

Attention: At this point it has to be checked that the tailing edge of all Blades is in right position in turning direction – backside aligned.

6 Setting Up

Adjustment occurs via an adjustment gauge. The appropriate adjusting angle is recommended by your dealer. This information does not substitute for thorough control via revolution counter. During static test a maximum engine speed has to be attained, which should be about 10% below rated speed. Only measurements during the flight can result in a final adjustment after corrections to the adjusting angle. The adjustment has to be made by a water-level. Your dealer advises the optional setting angle.

1. Turn the propeller blade into horizontal position.

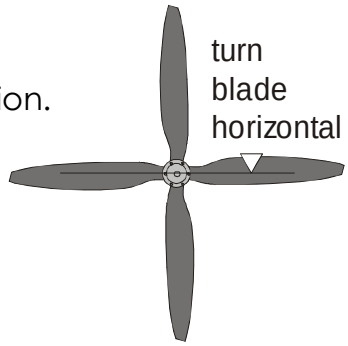
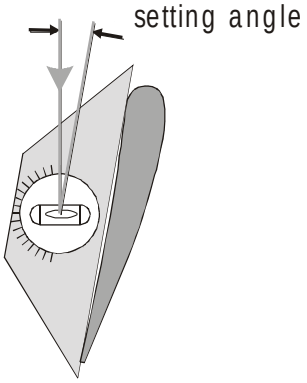


Figure 4: Align of the Propeller

2. The following alternatives can be chosen for setting up:
   A) The flange and the aircraft respectively has to be aligned horizontal and the
   wanted angle adjusted.
   B) The flange and the aircraft respectively has **not** to be aligned horizontal. Now
   the angle between the flange (aircraft) and the horizontal has to be allow for the
   setting up.



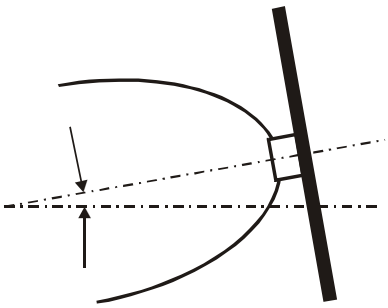


Figure 5: Adjust of the angle at the gauge referring

Figure 6: Motor-flange angel to the horizontal

3. Position the adjustment gauge 5 cm from the blade tip.

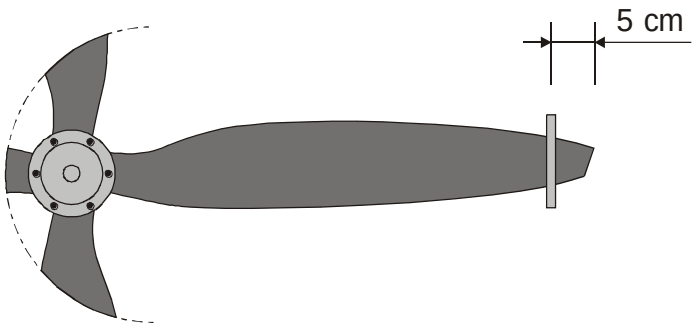


Figure 7: How to put the gauge on the blade

4. After loosen the M6-screws turn the blade to central position of the spirit level and tighten the screws loosly hand-screwed once again. Strongly bending to front and back simplifies the turning of the blade.
5. Repeat the adjusting procedure on all blades.
6. Control the adjustment of all blades again. Inexactness more than a half degree causes a to heavy aerodynamic unbalance.
7. Tighten the M8 bolt to a torque of 25 Nm cross-over.
8. Tighten the M6 bolt to a torque of 12 Nm cross-over.
9. As the screws interact repeat these both procedures.

After controlling the maximum ground engine speed the interim setting up is done for a test flight. Please note that possibly not the complete engine power is available or otherwise the engine can be overwind during faster flight.

Ensuring that the aircraft is restrained against forward motion, start the engine. Once the engine has reached its normal operating temperature, slowly open the throttle up to its full value. Observe the maximum engine r.p.m.. The maximum engine r.p.m. stated by the manufacturer should not be exceeded. With the aircraft at rest the engine r.p.m. should not exceed 95% of the manufacturers recommended maximum.

The mounting of the Propeller has to be checked (retightening of screws) after 3 working hours.

To retain the screws there are the following alternatives possible:

- the preferred solution is to use a wire as bolt retaining device.
- for Propeller flanges with through holes self locking nuts can be used.
- if the first alternatives are not possible also loctite 372 can be used.

7 Pre-Flight Checks

Before every flight the following has to be controlled:

- Check blades for security of mountings.
- Blades cannot be turned by hand.
- Check engine / Gearbox bearings for excessive play.
- Blades are not damaged and have no cracks
- Hub without cracks
- Check bolts for tightness and security of wire locking.
- Check clearance between propeller-blade tips and propeller guard.

Simply slight resin-flaking by debris can be accepted, but should be repaired shortly. The repair can be done with economical application. If the check is not satisfactorily the handling has to be stopped and the propeller repaired.

Warning:

A propeller failure has more serious consequences than an engine failure! Due to damaged blades an unbalance can arise, which can cause the motor to be torn out of its bracing, thereby changing the proportions of the centre of gravity in such a way that a stable flight attitude cannot be maintained.

8 Maintenance

The propeller should be cleaned at the end of each days operation.

This prevents the built up of dried grass and insects etc. on the blades. Cleaning of the blades should be carried out with a soft sponge using a weak detergent solution.

Annually, the propeller should be polished professionally. It is recommended that this is carried out by a respected coachbuilder or similar facility.

9 Warranty

HELIX Carbon GmbH warrants the Propeller for two years from the date of purchase (according to German law). The warranty covers material defects but does not cover subsequent losses.

The operator flying with this Propeller does so at his/her own risk.

Any claim will only be considered if the Propeller has been installed and used in accordance with this manual.